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Westman Champlin & Kelly
900 Second Avenue South
Suite 1600 International Centre
Minneapolis, MN 55402-3319

EXAMINER

YAM, STEPHEN K

ART UNIT PAPER NUMBER

2878

DATE MAILED: 05/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/913,673

Applicant(s)

GU ET AL.

Examiner

Stephen Yam

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *E. parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) 26-45 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Claims 1-25 in Paper No. 8 is acknowledged.
2. Claims 26-45 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Election was made **without** traverse in Paper No. 8.

Claim Objections

1. Claims 1, 2, 4, and 25 are objected to because of the following informalities:
In Claims 1 and 2, "the refractive index" lacks proper antecedent basis.
In Claim 4, "A method according to any one of claim 1" should be changed to "A method according to claim 1".
In Claim 25, "claims 19" should be changed to "claim 19".
Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-10, 16, 18, and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Rentzepis US Patent No. 5,268,862 (hereinafter "Rentzepis '862").

Regarding Claim 1, Rentzepis '862 teaches a method of writing and erasing optical data comprising focusing light (see Col. 18, lines 60-63) on a photorefractive polymeric material to cause two-photon excitation (see Col. 8, lines 1-3) of the material at the focal point thereby modulating a refractive index of the material at the focal point (see Fig. 2) to record data, and illuminating (see Col. 12, lines 46-48 and Col. 13, lines 28-39) the material with radiation to erase the recorded data.

Regarding Claim 2, Rentzepis '862 teaches a method of writing and re-writing optical data in a photorefractive polymeric material comprising focusing light (see Col. 18, lines 60-63) on the photorefractive polymeric material to cause two-photon excitation (see Col. 8, lines 1-3) of the material at the focal point thereby modulating a refractive index of the material at the focal point (see Fig. 2) to record data, illuminating (see Col. 12, lines 46-68 and Col. 13, lines 28-39) the material with radiation to erase the recorded data, and focusing light (see Col. 18, lines 60-63) on the photorefractive polymeric material to cause two-photon excitation (see Col. 8, lines 1-3) of the material at the focal point thereby modulating a refractive index of the material at the focal point (see Fig. 2) to re-write data (see Col. 10, lines 11-14) in the photorefractive polymeric material.

Regarding Claim 3, Rentzepis '862 teaches the modulation of the refractive index caused by the two-photon excitation as a refractive index inhomogeneity resulting from a non-uniform space-charge distribution within the region of excitation within the photorefractive polymeric material (see Col. 4, lines 9-14 and 60-64).

Regarding Claim 4, Rentzepis '862 teaches the photorefractive material illuminated with electromagnetic radiation having a wavelength in the visible spectrum (see Col. 13, lines 28-30)

to produce a redistribution of the special distribution of the electric charges forming bits of the data to erase the recorded data (see Col. 7, lines 22-26).

Regarding Claim 5, Rentzepis '862 teaches the photorefractive polymeric material such that it absorbs radiation in only a narrow band in the UV to visible region of the electromagnetic spectrum (see Fig. 4 and 5 and Col. 8, lines 1-5).

Regarding Claim 6, Rentzepis '862 teaches the maximum of the absorption band of the photorefractive polymeric material falling substantially within the range from about 380nm to about 600nm (see Fig. 4 and 5 and Col. 16, lines 62-66).

Regarding Claim 7, Rentzepis '862 teaches the photorefractive polymeric material absorbing substantially no radiation above a wavelength of about 630nm (see Fig. 4 and 5).

Regarding Claim 8, Rentzepis '862 teaches the data recorded in the photorefractive polymeric material read by illuminating the photorefractive polymeric material with coherent light of a wavelength falling substantially within the range from about 630nm to about 1200nm (see Col. 12, lines 15-28).

Regarding Claim 9, Rentzepis '862 teaches the light used to record data in the photorefractive material having a wavelength falling substantially within the range from about 750nm to about 1200nm to cause two-photon excitation (see Col. 9, lines 54-57 and Col. 11, lines 22-24).

Regarding Claim 10, Rentzepis '862 teaches (see Col. 14, lines 23-26) a pulsed laser beam used to record data in the photorefractive polymeric material.

Regarding Claim 16, Rentzepis '862 teaches the photorefractive polymeric material including at least 25% of a polymer by percentage weight (See Col. 14, lines 51-56).

Regarding Claim 18, Rentzepis '862 teaches the photorefractive polymeric material including a photosensitive material which provides absorption in the UV to visible region of the electromagnetic spectrum (see Fig. 4 and 5 and Col. 8, lines 1-5).

Regarding Claim 22, Rentzepis '862 teaches the polymer comprising polymethylmethacrylate (MMA) (see Col. 14, lines 45-46).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rentzepis '862 in view of Wilde US Patent No. 5,864,412.

Rentzepis '862 teaches the method in Claim 1, according to the appropriate paragraph above. Rentzepis '862 does not teach a continuous wave laser beam used to record data in the photorefractive polymeric material. Wilde teaches a method of writing and erasing optical data (see Col. 1, lines 15-17, Col. 3, lines 7-9, and Col. 6, lines 3-5) using two-photon excitation (see Col. 5, lines 50-53) wherein a continuous wave laser beam (see Col. 6, lines 6-10) is used to record data in a photorefractive material. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a continuous wave laser beam as taught by Wilde in the method of Rentzepis '862, to reduce power usage through reduced-intensity lasers.

6. Claims 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rentzepis '862 in view of Rentzepis US Patent No. 5,325,324 (hereinafter "Rentzepis '324").

Rentzepis '862 teaches the method in Claim 1, according to the appropriate paragraph above. Rentzepis '862 does not teach polarized coherent light used to record polarized bits of data in the photorefractive polymeric material, different polarization states of the recording beam used to record multiple bits of data at the same position having different polarization states, bits of recorded data read using a reading beam having an appropriate polarization state. Rentzepis '324 teaches a method for writing and erasing optical data (see Col. 8, lines 7-11) comprising focusing light on a photorefractive material using two-photon excitation (see Col. 8, lines 34-38), wherein polarized coherent light (see Col. 6, lines 58-63) is used to record polarized bits of data in a photorefractive polymeric material, different polarization states of the recording beam are used to record multiple bits of data (see Col. 9, line 65 to Col. 10, line 3), wherein the bits of recorded data are read using a reading beam having an appropriate polarization state (see Col. 10, lines 30-54). Inherently, if optical data is recorded by setting a polarization state on a medium, the optical data is erased by *resetting* the polarization state on the medium. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use polarization as taught by Rentzepis '324 in the method of Rentzepis '862, to provide a clear distinction between bit patterns on the medium.

7. Claims 17, 19-21, and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rentzepis '862 in view of Meerholz et al. US Patent No. 5,744,267.

Rentzepis '862 teaches the method in Claims 1, 16, and 18, according to the appropriate paragraph above. Rentzepis '862 does not teach the photorefractive polymeric material comprising by weight, 25%-99.5% of a polymer, 0.5%-60% of a chromophore providing absorption in the UV to visible region of the electromagnetic spectrum, 0.5%-5% of a photosensitive material, and 0%-40% of a plasticizer, wherein the polymer comprises PVK, the chromophore comprises DMNPAA, the photosensitive material comprises TNF, and the plasticizer comprises ECZ. Meerholz et al. teach a photorefractive polymeric material (see Col. 3, lines 37-41) for writing and erasing optical data (see Col. 3, lines 46-49) comprising by weight, 33% of the polymer PVK (see Col. 5, lines 52-54 and Col. 8, lines 38-45), 50% of the chromophore DMNPAA (see Col. 8, lines 38-45), 1% of the photosensitive material TNF (see Col. 5, lines 54-56 and Col. 8, lines 38-45), and 16% of the plasticizer ECZ (see Col. 7, lines 5-10 and Col. 8, lines 38-45). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the photorefractive polymeric material composition of Meerholz et al. in the method of Rentzepis '862, to provide optimal optical storage at or below room temperature conditions, as taught by Meerholz et al. (see Col. 3, lines 55-59).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Yam whose telephone number is (703)306-3441. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (703)308-4852. The fax phone numbers for the

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organization where this application or proceeding is assigned are (703)308-7724 for regular communications and (703)308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

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May 14, 2003


DAVID PORTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800